ARMY GEOSPATIAL PORTABLE DOCUMENT FORMAT (GEOPDF) PROJECT

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Winner:
2006 Director's Award - TEC
2008 Achievement Award / Military – USGIF
Finalist:
2009 Public Sector Max Award - Adobe

US Army Corps of Engineers
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Unclassified

GeoPDF Overview

- Provides a Standard format for use and exchange of GIS documents with non-GIS users [soldiers, marines, sailors and airmen] and allows them to leverage valuable geospatial assets
- A **stand alone file**; no web or data links; image, text, fonts, graphics, customer data, GIS data and metadata are all contained in one file
- Leverages **free** Adobe Reader (ISO standard) multiple languages
- Intuitive Adobe Reader interface - no training required
- **Free** TerraGo Toolbar for Adobe Reader plug-in to view “Geo” part of GeoPDF

  [all TerraGo tools have Army Certificates of Networthiness & the free toolbar plug-in is on the Army Golden Master | other acceptance & certification: *NGA.Net baseline, CIA.Net baseline, NGA IEC Program Acceptance, NGA NDS Program Acceptance, Navy Marine Corps Internet | U.S. Army Armament Research and Development Center (ARDC), Research, Development and Engineering Center (RDEC) acceptance and deployment, US Dept of Agriculture's (USDA) Natural Resource Conservation Service (NRCS)*]
- Significantly smaller data files than traditional GIS formats (COTS or MILSPEC)
- Complies with Adobe's PDF specification
- Identified as “Best Practice” by Open Geospatial Consortium (OGC)

What does a GeoPDF do

With Adobe Reader:

- Multiple [automatic] coordinate displays [default is Lat/Long and MGRS]
- Supports 400+ datums and 40+ projections

  (based on both GEOTRANS and the Geospatial Data Abstraction Library [GDAL])
- Can capture coordinates and “go out to” Google Maps and compare
- Measure area / length with Reader [w/o file having to be reader enabled]
- GPS Tracking
- Importing/exporting geospatial data with files that are Reader/GeoMarked Enabled *[Comma separated - cvs, XML data format for the interchange of GPS data - gpx, Google Earth storage format – kml, Google Earth compressed storage format – kmz, Shapefile GIS file format – shp/shm]*

With Adobe Acrobat:

All above
Create GeoPDF manually
GeoMark/Enable files for extended use in Reader
Map Assembler for combining multiple GeoPDF files

“…there are about 1 million users of GIS software. There are about 6 billion people. So there are 5.999 billion other people who don’t like using GIS software. We built something for them.”

Michael Jones

Google Earth

Chief Technology Office

Geospatial Solutions

May 2006

GeoPDF Creation

Vector GeoPDF

- GIS data is output directly into GeoPDF format

Raster GeoPDF

- Paper maps are scanned or use existing jpg/tiff files which are then saved in a PDF format and georeferenced

Hybrid GeoPDF

- Both Raster and Vector data

Topographic Line Map (TLM) 1:50,000 scale - 300 dpi

Seoul	312.0	MB	GeoTIFF (uncompressed)
	10.0	MB	MrSid
	9.7	MB	JPEG
	8.8	MB	TIFF/ZIP
	5.0	**MB**	**GeoPDF**

GeoPDF activities complete

Raster

- NGA Research Center has converted most of their standard products into raster GeoPDF (33,000+)

- Army Geospatial Center has packaged up these maps by country with an Index Map; now distributes via DVD and has them posted on websites *[193 available]*. NGA has begun to take over production, maintenance and distribution [via DLA] of these GeoPDF Country Coverages

- AGC converted nearly 60,000 USGS Digital Raster Graphic files from GeoTIFF to GeoPDF. USGS has posted all of them on the USGS store website along with new GeoPDF

- AGC will produce State Datasets with Index Map

U.S. Topo *[USDA imagery and National Map data]* – which will be distributed by USGS

GeoPDF activities on going

Vector

- Every new and updated map contract NGA signs has a provision that requires a vector GeoPDF be produced as a map sheet is created.

As the vector GeoPDFs are created they replace the raster GeoPDF

- Army produced mission specific products

All Army Geospatial Engineering Teams [via the Army's Digital Topographic Support System (DTSS v11 or Digital Common Group Station System Geospatial [DG] 2.0 as it now known is being fielded now)] along with EUCOM and PACOM Theater Geospatial Databases have TerraGo's tools for Adobe Acrobat and ESRI ArcGIS.

Other

AGC will convert its ADRG and CIB holdings to GeoPDFs.

The IENC (Inland Electronic Navigation Chart) Data Team plans to publish all IENC data [~7800 miles of navigable waterways in the USA], in GeoPDF format.

NGA - Geospatial Intelligence Baseline for Contingency Operations [GIBGO],

Iraq Country / City Atlases and Afghanistan Country Atlases, Olympics support, deployed CENTCOM support, etc. all use GeoPDF with international co-production partners - Canada, United Kingdom, South Korea

GeoPDF activities - on going II

- **NGA Research Center has begun to convert their holdings of native maps into raster GeoPDF**

- **All Army Geospatial Engineering Team's DTSS is loaded with TerraGo software suite for creation and manipulation of GeoPDF**

- **AGC Imagery Library's online imagery distribution system** [iCubed's DataDoors] **exports to GeoPDF**

also GeoEye and DigitalGlobe provide products in GeoPDF

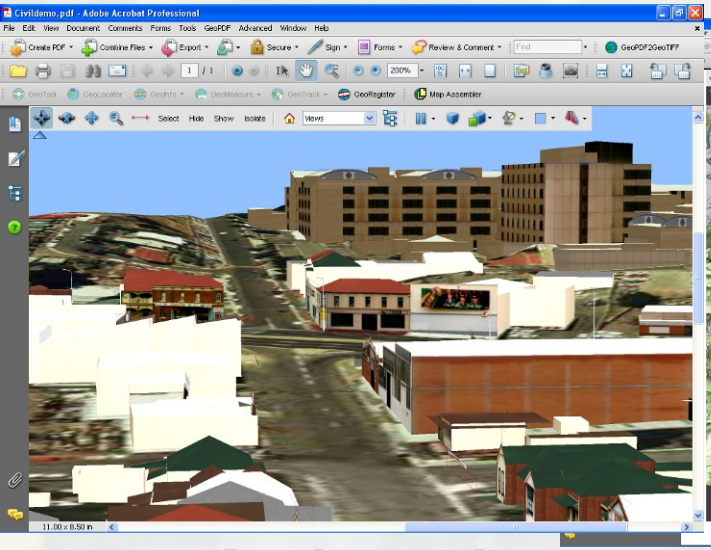
- **AGC converting their Urban Tactical Planners (UTP), Engineering Route Studies (ERS) and Library holdings of non-NGA products and atlases into GeoPDFs**
- **AGC creating Urban Water Graphics (UWG), Buckeye Map Book (BMB), Cultural Maps and Country/Area Overviews in GeoPDFs**

GeoPDF activities - on going III

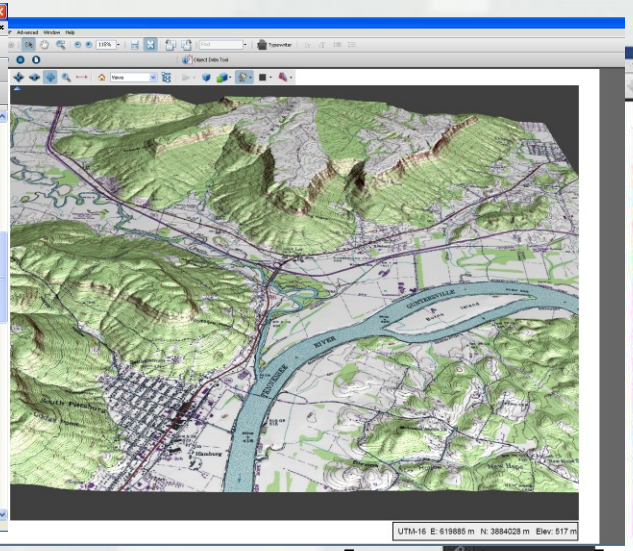
- **Seamless viewing of GeoPDF in Adobe Reader**

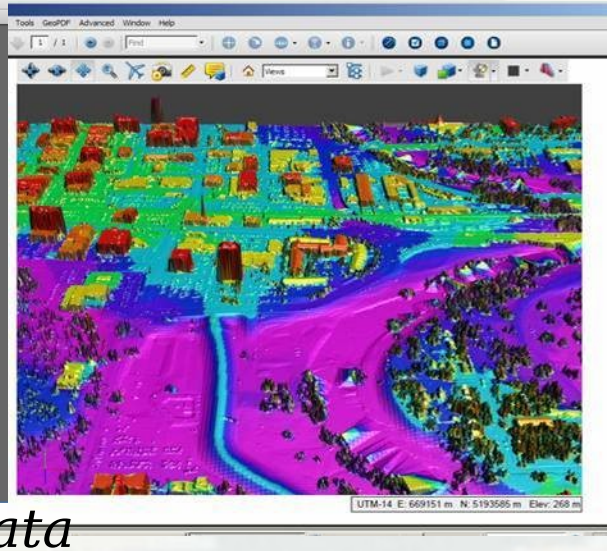
- **Reading of GeoPDF in Voyager GIS [a web style search tool]**

3D GeoPDF



fly-throughs





elevation data

[LiDAR derived]

GeoPDF feedback

"So far the DVDs with the map data from TEC has been a huge success. I even passed a few to a soldier on an MTT while waiting for our flight. Folks who don't have access to much data are extremely appreciative when they get something with nothing expected in return."

"...literal lifesaver"..."has revolutionized the way we do business. We get more workable products out to the warfighter"

"a tremendous asset to my operations"

"That's a pretty awesome product."

"used the geopdf country dvds as m
and printed the sheets all the time!!!
The country dvds are geospatial hero
the war!!!!! "

"The GeoPDF's you sent provided us with the following:
- Instant access to much needed mapping data
- Ability to send data over secure net to Commanders
- MGRS capability
- Delivered media (PDF's)
- Size of data (less is better)
- Ease of use for incorporating into presentations
- Clear, viewable, aerial photography and topographical maps."

"This is great stuff!" I love the GeoPDF!

"data will be of real help

"They are such great products"

"I'm not a GIS professional; I'm an artilleryman. Recently, I discovered the GeoPDF files.. and thoroughly enjoy them. They make maps easy!"

guys here in the field...love the GeoPDFs

"Wohooo!"

I just can't get enough of your GeoPDF program. It is fantastic.

"The CDs you sent were far

"we have some useful maps now to use."

"these DVDs will be very helpful"

"I think it's kick ass product... Probably the best product out there for my use..."

"We love the geopdf format. It's been very popular among our users here in Korea."

"GeoPDF is the way of the future"

"...a huge success an
has gone over very w

"The GeoPDF tool for the reader has proven invaluable"

"...the map depot was closed we were able to quickly rely on our GeoPDF DVD and crank out the copies of the map sheets we needed in less than an hour."

"The CD with maps on it that you gave me is very, very impressive!!!! "

"We will be encouraging the VHPA [Vietnam Helicopter Pilots Association] members to share...memories with others whom served with them. I believe the maps are the

"it has truly transformed CET operations."

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GIS/Mapping software 2,000,000 + users*

* Geographic Information Systems and Science by Longley, Goodchild, Maguire, and Rhind

Adobe Reader 800,000,000+ users

20 disks for Iraq*

*As order from the DLA Map Catalog

2 DVDs for Iraq

CADRG

GeoPDF

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Software Products

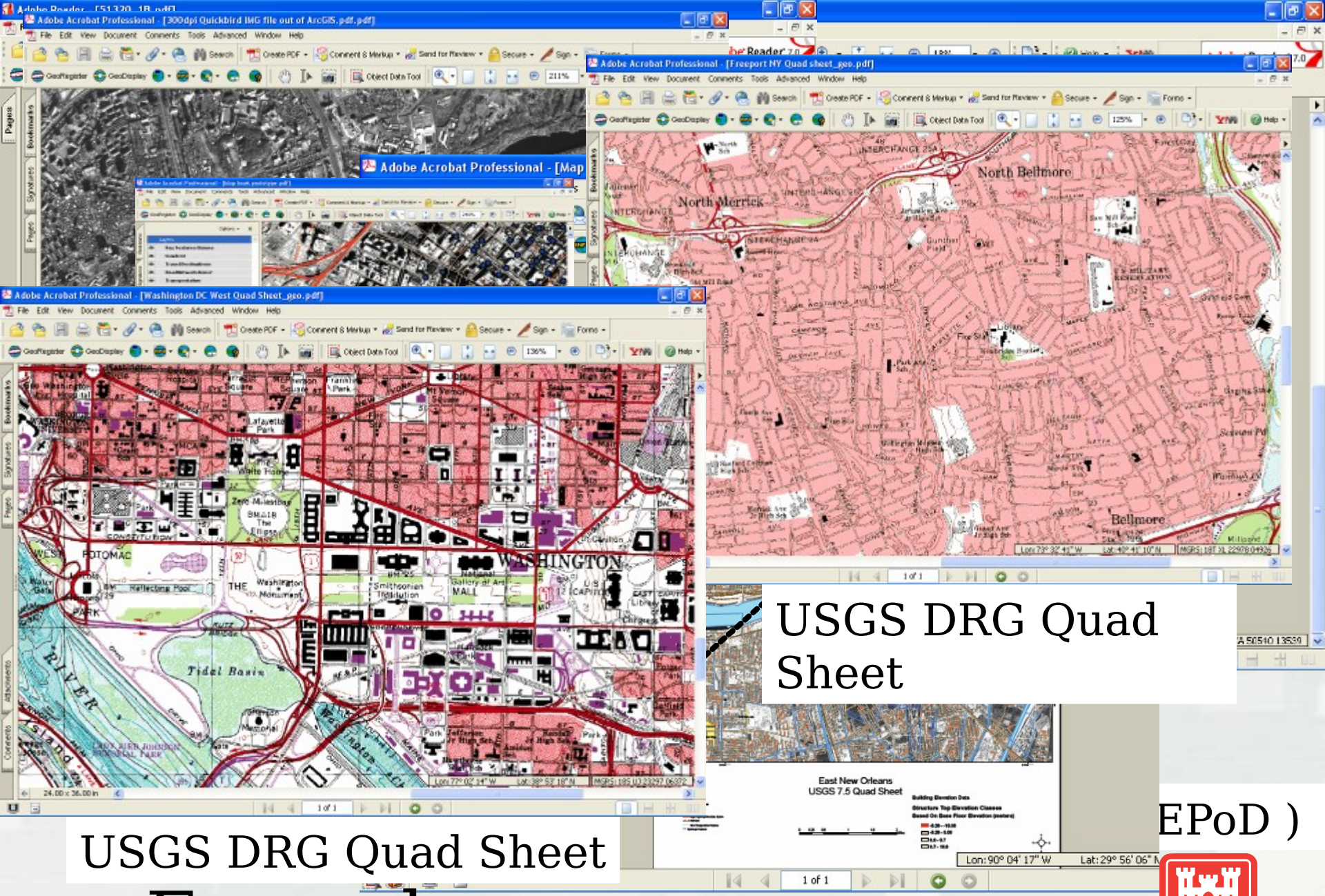
Viewing and Collaborating with GeoPDF Files	Desktop Creation of GeoPDF Files	Server Creation of GeoPDF Data & GeoPDF Data Sets	Adding Business/Operational Context to GeoPDF Files - Mapbooks
TerraGo Toolbar (Free)	TerraGo Publisher for ArcGIS	TerraGo Publisher for ArcGIS Server	TerraGo Composer **for Acrobat**
TerraGo Mobile (Windows Mobile 5 or Mobile 6 Compatible Device)	TerraGo Publisher for GeoMedia	TerraGo Composer for Server	
TerraGo Web (Viewing GeoPDF files in a web browser – Free)	Publisher for Raster → **converts: GeoTIFF, MrSID, NITF, IMG, CIB, ADRG and CADRG into GeoPDF**		
	Publisher for Socet GXP		
	Publisher for ERDAS IMAGINE		

TerraGo Publisher for ArcGIS also views/imports GeoPDF

[view only is free to the DoD – see AGC websites for download link]

The DoD's FalconView *[mid '10]* & FalconView *[late '10]* will view/write GeoPDFs.

Also Bentley's MicroStation, ArcGIS & Acrobat produce ISO 32000 PDF Maps



USGS DRG Quad Sheet

USGS DRG Quad Sheet

EPoD)

Examples

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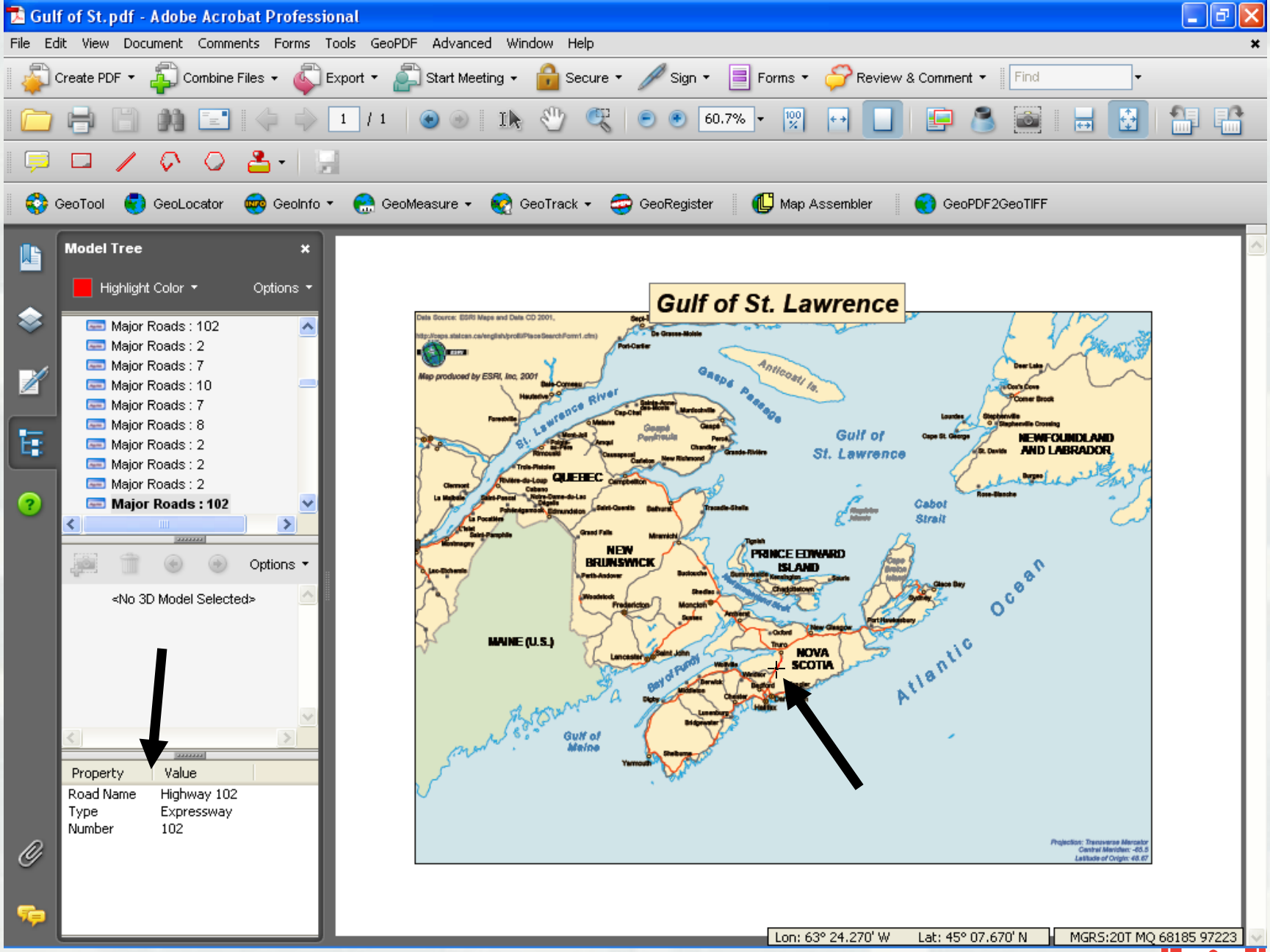
layered & attributed



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If you have any GeoPDFs that you have created please contact me as I would like to obtain them for posting on the AGC websites

How to obtain GeoPDFs

On DVD:

http://www.agc.army.mil/cmb/request/cmbrequestForm.cfm

via the Web:

Unclassified PKI web site (CAC card and reader needed):
https://tsunami.tec.army.mil/Products/MapArchive

SIPRNET
www.tec.army.smil.mil/Products/MapArchive

JWICS
www.tec.ic.gov/Products/MapArchive

Other GeoPDF contact info

Web:

NGA GeoPDF files can be obatined_

via the SIPRNET at www.nga.smil/products/echart

via the JWICS at www.nga.ic.gov/products/echart

via the NGA Resource Center's Maps Online or Voyager

TerraGo Technologies:

www.terragotech.com

Thank you

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